

## Math 110 Section 17

Quiz 1

Name \_\_\_\_\_

September 19, 2005

Instructor: Charles Cuell

Student Number \_\_\_\_\_

All solutions are to be presented on the paper in the space provided. The quiz is open book. You can discuss the problem with others and ask the TA questions.

- (1) Rewrite the following expression without absolute values:  $|4 - x^2|$

The definition of absolute value gives:

$$|4 - x^2| = \begin{cases} 4 - x^2 & \text{when } 4 - x^2 \geq 0 \\ -(4 - x^2) & \text{when } 4 - x^2 < 0 \end{cases}$$

Need to simplify by solving the inequalities on the right hand side.

$$\begin{aligned} (4 - x^2) &\geq 0 \\ (2 - x)(2 + x) &\geq 0 \end{aligned}$$

Use a sign table:

	$x < -2$	$-2 < x < 2$	$x > 2$
$(2 - x)$	+	+	-
$(2 + x)$	-	+	+
$(2 - x)(2 + x)$	-	+	-

So, the expression is

$$|4 - x^2| = \begin{cases} -(4 - x^2) & x < -2 \\ 4 - x^2 & -2 \leq x \leq 2 \\ -(4 - x^2) & x > 2 \end{cases}$$

- (2) Write the equation of the line that goes through the point  $(-1, 6)$  and is parallel to the  $x$  axis.

The equation of the  $x$  axis is  $y = 0$ . So the slope of the line we want is  $m = 0$ . Therefore, the equation of the line is

$$y = 6$$